

Requirements for Welding Gases

Table 1
Gas Type, Purity, and Dew Point Requirements for Shielding Gas Components

Gas	AWS Classification	Product State	Minimum Purity (%)	Maximum Moisture ^a (ppm)	Dew Point Maximum Moisture at 1 Atmosphere		CGA Class
					°F	°C	
Argon	SG-A	Gas	99.997	10.5	-76	-60	Type I G-11.1 Grade C
		Liquid	99.997	10.5	-76	-60	Type II G-11.1 Grade C
Carbon Dioxide	SG-C	Gas	99.8	32	-60	-51	G-6.2 Grade H
		Liquid	99.8	32	-60	-51	G-6.2 Grade H
Helium	SG-He	Gas	99.995	15	-71	-57	Type I G-9.1 Grade L
		Liquid	99.995 ^b	15	-71	-57	Type II G-9.1 Grade L
Hydrogen	SG-H	Gas	99.95	32	-60	-51	Type I G-5.3 Grade B
		Liquid	99.995 ^c	32	-60	-51	Type II G-5.3 Grade A
Nitrogen	SG-N	Gas	99.9	32	-60	-51	Type I G-10.1 Grade F
		Liquid	99.998	4	-90	-68	Type II G-10.1 Grade L
Oxygen	SG-O	Gas	99.5	Not Applicable	-54	-48	Type I G-4.3 Grade B
		Liquid	99.5	Not Applicable	-82	-63	Type II G-4.3 Grade B

Notes:

a. Moisture specifications are guaranteed at full cylinder pressure, at which the cylinder is analyzed.

b. Including neon.

c. Including helium.

Table 2
Tests Required for Classification

	Gas Purity	Dew Point	Mixture Composition
Single gas	Req.	Req.	Not Applicable
Multicomponent gas	Req. ^a	Req. ^b	Req. ^c
Special gas mixture ^d	Req.	Req.	Not Required

Notes:


a. Each gas of a multicomponent mixture shall be tested for and meet the purity requirements of that specific gas (see Section 9 and Table 1).

b. The multicomponent gas mixture shall meet the dew point requirement not greater than the highest dewpoint of the individual gases in the mixture (see Section 10 and Table 1).

c. Individually filled cylinders or one cylinder from each filling manifold group, shall be tested for and meet the requirements of Part B, Tests, Procedures, and Requirements for the mixture composition.

d. These gases are classified as SG-B-G.

Table 3
**AWS Classifications for
Typical Gas Mixtures**

AWS Classification	 Typical Gas Mixtures (%)	Gas
SG-AC-25	75/25	Argon + Carbon Dioxide
SG-AO-2	98/2	Argon + Oxygen
SG-AHe-10	90/10	Argon + Helium
SG-AH-5	95/5	Argon + Hydrogen
SG-HeA-25	75/25	Helium + Argon
SG-HeAC-7.5/2.5	90/7.5/2.5	Helium + Argon + Carbon Dioxide
SG-ACO-8/2	90/8/2	Argon + Carbon Dioxide + Oxygen
SG-A-G	Special	Argon + Mixture